REMARKS

Status of Claims:

Claims 10-18 and 20-29 are present for examination.

Prior Art Rejection:

Claims 10, 11 and 14-18 and 20 stand rejected under 35 U.S.C. § 103 as obvious over Nomura (CA 2,112,145) in view of applicant's admitted prior art APA. Further, claims 12 and 13 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Nomura in view of APA and further in view of Takada (US 6,088,670). The Examiner's rejections are respectfully traversed.

The stated in applicant's prior response, the differences between applicant's invention and the primary Nomura reference may be seen from the below discussion.

The constitution according to (CA 2,112,145) (Nomura et al.) is as follows:

(1)   As for the frame with errors in the speech parameters such as a gain and a spectral parameter (filter coefficients),

(2)   by repeatedly using the speech data in the past frame by "bad frame masking unit",

(3)   a speech signal is reproduced for the frame with errors.

In addition, although the "bad frame masking unit" is divided into the voiced one and the unvoiced one, each is considered to be the fixed processing.

On the other hand, the features according to the present invention are:

(a)   in the section of unvoiced speech (a section of only the background noise without the speech),

(b)   by using a smoothing method based on "decoded information" (the speech parameters such as a gain and filter coefficients indicating the background noise),

(c)   smoothing of the speech parameters indicating the background noise is made in terms of time.

This feature is equivalent to changing the filter used for smoothing according to the characteristic of a background noise signal in an embodiment.

The object of the reference is to reproduce a speech signal for the frame with errors (to apply the above-mentioned processing to only the frame with errors), and it is completely different from the present invention which aims at an improvement of the sound quality of the background noise.

From the viewpoint of a constitution, according to the reference, the signal of the present frame is reproduced by repeatedly using the speech parameters of the past frame. For this reason, when it is applied to the transition section of the voiced speech and the unvoiced speech, or to the background noise in which power fluctuates in terms of time (for example, the noise in the office environment with various kinds of sound sources such as people's voices or call sounds of telephones, etc.). there is a problem of degrading the sound quality.

On the other hand, according to the present invention, the smoothing method based on the "decoded information" is used. Since the speech parameters of the "decoded information", that is, the gain and the filter coefficients, etc. indicate the character of the background noise, it becomes possible, according to the present invention, to make the appropriate smoothing of said speech parameters by the smoothing method corresponding to the characteristic of the background noise. As a result, it has the effect that good speech quality can be obtained for said transition section and various kinds of noises also.

With regard to Takada, the Examiner has pointed out that the voice detector (col. 8, lines 13-53) according to Takada (US 6,088,670) corresponds to wherein said identification/classification means performs identification/classification operation using a

value obtained by averaging for a long term a variation amount based on a difference between the decoded filter coefficients and their long-tent average" in claims 12, 13. However, the voice detector according to Takada inputs only a speech signal itself. Therefore, an application of Takada to the decoder which cannot use a speech signal as an input is impossible.

On the other hand, according to claims 12 and 13, the voice detection is performed based on the "decoded information (obtained from the input to an encoder)", such as "decoded filter coefficients". Therefore, claims 12 and 13, relating to a decoder and having the above-mentioned distinctive feature of using information as obtained from a decoder, have nothing to do with Takada.

In summary, Nomura describes a system for using a speech decoder for reducing the sound which is different from normal voiced speech that is generated in decoding of the frame which has an error in a speech parameter such as a gain or a spectral parameter (filter coefficient). Therefore, according to the decoding processing by Nomura, the reduction processing of the sound which is different from normal voiced speech that is generated is performed only for a frame which has an error.

On the other hand, the present invention reduces the sound which is different from normal voiced speech that is generated at the time of decoding due to the background noise signal included in the speech to be coded. Therefore, the decoding processing according to the present invention is performed at least in the unvoiced speech section regardless of an error of a speech parameter. On the other hand, according to Nomura, as long as there is no error in the speech parameter in the unvoiced speech section, the sound different from normal voiced speech that is generated resulting from the background noise in the unvoiced speech section is not improved.

According to the present invention, there is an advantage, which cannot be expected in Nomura, that the decoding quality is improved on the whole, since the sound different from normal voiced speech that is generated resulting from the background noise in the unvoiced speech section is reduced.

In view of the above, the present invention, in comparison with the reference, is completely different in all respects of the object, the constitution, and the effect.

In order to better differentiate and clarify applicant's invention as compared to the prior art, applicant has amended claim 10 recite:

> smoothing means for performing smoothing processing based on the decoded information for at least either one of the decoded gain and the decoded filter coefficients in ~~only~~ the speech signal with a background noise in at least the unvoiced speech identified by said identification means regardless of whether or not an error occurs in said decoded gain or decoded filter coefficients;

The underlined portions of the above claim 10 clearly differentiate applicant's invention from the combined teachings of Nomura, APA and Takada. This claim language is deemed to more clearly emphasize the distinguishing features of applicant's invention. As such, it is submitted that the PTO has not made out a *prima facie* case of obviousness under the provisions of 35 USC 103.

Claim 20 has been amended to be consistent with the changes made to claim 10. Further newly submitted method claims 21-29 (similar to the originally filed method claims 1-9) have been added and drafted such as to be consistent with the newly added limitations to claim 10. As such, it is submitted that all of applicant's claims are patentable over the prior art. Applicant's dependent claims are deemed patentable at least by virtue of their dependence on the independent claims.

Acknowledgment of Formal Drawings:

The Examiner is **again** (this is the third request) requested to acknowledge receipt and approval of the formal drawings for Figs. 1, 2 and 4 containing the amendments made thereto which were filed in the amendment dated May 5, 2003.

Conclusions:

The application is believed to be in condition for allowance and an early indication of same is earnestly solicited.

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The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date <u>December 21, 2004</u>   By _____

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